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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/014,479	12/14/2001	Hisashi Kobayashi	D-20,396	1014

27182 7590 08/25/2003

PRAXAIR, INC.
LAW DEPARTMENT - M1 557
39 OLD RIDGEBURY ROAD
DANBURY, CT 06810-5113

EXAMINER

WRIGHT, WILLIAM G

ART UNIT	PAPER NUMBER
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1754

DATE MAILED: 08/25/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/014,479

Applicant(s)

KOBAYASHI ET AL.

Examiner

William G. Wright SR.

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

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The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. § 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. § 103(c) and potential 35 U.S.C. § 102(f) or (g) prior art under 35 U.S.C. § 103(a).

Claims 1-12 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Sircar et al. '143 or Erickson '668 each in view of Keefer '903.

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Sircar teaches steam reforming of methane to produce hydrogen, at column 1 line 31 et seq. The teaching of product stream cooling and feed to another bed is also taught at the just stated area of column 1. The teaching of efficiency of operation using reaction temperature control and the use of specific fluids is found at column 3 line 30 et seq. and column 16 line 14 et seq. The teaching of both steam reforming of methane and water gas shift reactions is found at column 6 line 12 et seq. The teaching of the methane being converted to hydrogen and, the carbon dioxide having been absorbed, described by a profile found in Figure 3, is found at column 11 line 10 et seq. The Sircar reference at column 13 line 52 et seq. also teaches the sorption reaction phase, temperature change and pressure changes required for the process features of the instant claims to be carried out. Erickson teaches steam reforming of natural gas in the Abstract and light hydrocarbons in claim 1. The teaching of improvements by combining process parameters is found at column 2 line 24 et seq. Also the teachings of column 3 line 19 et seq. are of importance to the variables found in the instant claims.

The primary references teach efficiency and process variables, but neither teaches a method by which these features may be obtained.

The supporting reference to Keefer teaches the steam reforming of methane at claim 14 of column 32 line 31 et seq.

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The reference also teaches specific methods by which the pressure and heat changes of the instant claims can be accomplished. The teaching of an absorber regenerator concept with heat flow is found in column 30 line 9 et seq. The specific teaching of a heat engine is found at column 32 line 3.

The instant claims require the feature of heat flow, absorbing species and the use of these features in the production of hydrogen from methane. The primary reference teaches the production of hydrogen from methane and that the features of heating, cooling and absorbing are required for this end result. The motivation to accomplish this end result is effected by the application of the teachings of the supporting reference to Keefer. In Keefer the teachings of specific methods to accomplish the instant claimed features are taught and the instant claims are considered obvious in light of the teachings applied.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William G. Wright, Sr. whose telephone number is (703) 305-7792. The examiner can normally be reached on Monday through Thursday from 6:30 A.M. to 5:00 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman, can be reached on (703) 308-3837. The fax phone number for the

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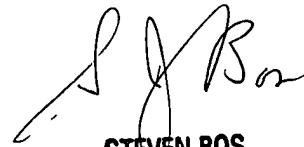
organization where this application or proceeding is assigned are (703) 872-9306 for the regular communications and (703) 872-9311 for after final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-1495.



W. G. Wright, Sr.:cdc

August 18, 2003



**STEVEN BOS
PRIMARY EXAMINER
GROUP 1100**